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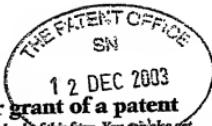
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1. Your reference

MO1XA/03

2. Patent application number

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0328873.5

12 DEC 2003 *Verity*3. Full name, address and postcode of the or of each applicant (underline all surnames)

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Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

696 0983001

8772261001

4. Title of the invention

CUBE SHAPED LAMP AND PROJECTION DEVICE FOR SINGLE SLIDE

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

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Patents ADP number (if you know it)

6. Priority: Complete this section if you are declaring priority from one or more earlier patent applications, filed in the last 12 months.

Country

Priority application number
(if you know it)Date of filing
(day / month / year)7. Divisionals, etc: Complete this section only if this application is a divisional application or resulted from an entitlement dispute (see note 8)Number of earlier UK application
(if known)Date of filing
(day / month / year)8. Is a Patents Form 7/77 (Statement of inventorship and of right to grant of a patent) required in support of this request?

No

Answer YES if:

- a) any applicant named in part 3 is not an inventor, or
- b) there is an inventor who is not named as an applicant, or
- c) any named applicant is a corporate body.

Otherwise answer NO (See note 8)

Patents Form 1/77

9. Accompanying documents: A patent application must include a description of the invention. Not counting duplicates, please enter the number of pages of each item accompanying this form:

Continuation sheets of this form

Description

4

Claim(s)

2

Abstract

1

Drawing(s)

5

x 5 SW

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for a preliminary examination and search (Patents Form 9/77)

Request for a substantive examination (Patents Form 10/77)

Any other documents (please specify).

11. I/We request the grant of a patent on the basis of this application.

Signature(s)



Date 12/12/03

12. Name, daytime telephone number and e-mail address, if any, of person to contact in the United Kingdom

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Notes

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CUBE SHAPED LAMP AND PROJECTION DEVICE FOR SINGLE SLIDE

BACKGROUND OF THE INVENTION

1) Field of the Invention

This invention relates to a cube shaped lamp and projection device which when opened can project a single slide onto a ceiling, wall or projection surface. The present invention in a preferred embodiment comprises six substantially flat and identically moulded side casings that are modular and can be assembled to form a cube with the top surface hinged so as to provide a lid and reflection surface capable of being projecting at various angles and also soft illumination through semi-translucent cube panels.

2) Description of the Prior Art

There is substantial and diverse prior art dating over the last century on various inventions and designs for slide projectors and lamps in general, including some recent art. However, no such prior art has all the features described and claimed herein. As an example no such examined prior art discloses the cubic assembly using modular panels which make use of a hinged mirrored cube lid to project the image onto a desired projection surface. Furthermore, our invention uses modular interlocking panels that provide an innovative arrangement of support structures and grooves that fix the internal parts of the illumination system depending on their rotation and orientation. Nor does prior art provide for a single slide projector which uses the side casing in such an ornamental design as described herein to function as a soft illumination lamp.

The majority of prior art on simple slide projectors teaches optical arrangements for advanced focusing of slide projectors or photographic enlargers, mechanisms for automating slide movement or combinations with audio-visual elements, combinations with modern LCD and LED projection technology or novel optical arrangements for projecting regular images from off-axis angles, or combination with projection clock elements. Few examples disclose single slide projectors which in general relate to novelty lights, hand-held or portable viewers of single slides rather than custom devices for projecting single slides.

By way of example U.S. Patent 5,517,264 by Sutton discloses a projector night light where a slide is displayed directly onto a viewer display within the lamp and also onto a ceiling. Similarly U.S. Patent 5,311,226 by Karasawa discloses a toy projector with local illumination of ornamental shapes around the lighting box. U.S. Patent 5,247,192 by Pan discloses a projection clock using a reflective clock surface as the image.

In terms of recent ornamental designs U.S. Patent D400,553 by Kung discloses a ornamental design for a portable slide projector. U.S. Patent D0474301 by Seal discloses a recent ornamental design for a projector lamp and references some further recent examples.

To the best of the applicant's knowledge, the prior art, whilst suggesting some features and numerous variations relevant to slide projectors and lights in general, the prior art has not disclosed some of the highly advantageous features of the present invention discussed herein.

SUMMARY OF THE INVENTION

The lamp and projection device of the present invention, in its preferred embodiment, comprises a cube shaped assembly constructed from six identical modular faces that interlock at the edges by means of adjacent recesses and protrusions on opposed edges. Said cube shaped assembly forms a box containing an illumination and projection system consisting of a lamp or at least one light-emitting unit, a electrical transformer unit and switches, a plurality of reflecting mirrors and at least one condensing lens arranged in a suitable optical arrangement around a mid vertical axis of the cube where a slide can be positioned. The top face of the cube functions as a lid which is arranged to be hinged at one edge and to support a mirror on the inside surface and is capable of being positioned at any angle between a closed position and an open perpendicular position such that it can project an image of a slide onto a nearby wall or projection surface, or onto a ceiling when fully open. Said lid would compress a micro-switch when closed to turn the lamp off or on when opened. Said faces are designed to have an identical interior structure consisting of grooves and support structures that hold and fix the components of the illumination and projection system such as the reflecting mirrors, lens holder, bulb holder and electrical components. These faces are designed such that grooves perform different functions (e.g. hold a slide or lens holder) or are not used depending on their position and rotation in the cube assembly. The interior of the cube also houses a sheet metal bulb holder which is bent and punched to hold a lamp and dissipate heat and to slot into appropriate grooves in the cube side casing as well as to reduce vertical light leakage. Said lens is arranged to be supported in a holder which slots into grooves in the cube side casing and passes through a punched recess in the casing to connect to a control button in such a manner as to enable vertical sliding and control of lens position for focusing. The overall geometry of the cube and symmetrical arrangement of bulb, lens and mirrors about the central cube axis containing the slide provides a simple but effective optical arrangement for projection of a single slide. Said bulb is positioned close to the central axis and in a preferred embodiment consists of a low voltage parabolic bulb of specific spread matching the geometry of the cube so as to provide equal illumination across the slide surface.

The overall faces of the cube in a preferred embodiment are formed from a semi-translucent and coloured material to enable soft illumination and glowing of the whole cube such that the device acts both as a soft lamp and also as a controlled single slide projector via the movable mirrored lid onto an appropriate surface.

A significant feature of the device is that the main body can be assembled from six identical pieces lending itself to low cost manufacture, e.g. by plastic injection moulding with a suitably heat resistant plastic.

A further benefit of the design is that the hottest part of the device surrounding the bulb can be formed at low cost from a punched and folded metal sheet which slots into the plastic side-casing and is designed to dissipate heat via vents and folds. A specific benefit of the overall cube design is that the device lid is always open at an angle when the lamp is on helping to provide a large open

cross-section of air-flow to help cool the overall device through air circulation, as well as to provide the user with easy control on projection.

An additional benefit of the six side cube assembly via moulding is in the provision of suitable cavities passing almost all the way through the side that are punchable during installation to enable the overall device to be fixed to a surface or wall and used as a wall lamp. Similar cavities would also be used in a preferred embodiment to imprint text of logos and enable brighter illumination through the cube or to cast a suitable ornamental shadow onto a nearby surface.

A further benefit of the device is that the slide can be changed by moving the lens holder down when the device is turned off by means of an external switch. This enables the user to substitute their own slides. By way of example the device could be used to project a circular slide image of a planet or moon onto the ceiling and used as a night light, or contain nature or landscape images or family portraits onto a ceiling or wall, or used in interior decoration, museums, retail situations or entertainment situations to cheaply project suitable imagery onto a nearby surface. The low cost of the device has the benefit that a plurality of devices could be used in a linear arrangement on a wall or corridor to project anything from single letters, to multiple graphics or different colours.

The overall device therefore provides an aesthetic cubic arrangement which can be used in a variety of manners and provides control for single slide projection as well as soft illumination and is designed from few unique parts for low cost manufacture using in a preferred embodiment a single lens and bulb source without a need for a mechanical cooling fan due to the overall design, metal heat vents and open top.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 shows a three dimensional view of the overall lamp and projector device.

FIG. 2 shows a three dimensional view of the overall lamp and projector device with one cube face removed for clarity.

FIG. 3 shows a three dimensional exploded view showing the key components and device assembly

FIG. 4 shows a three dimensional view of the metal support plate for the bulb

FIG 5. shows a view of the modular cube side casing showing the arrangement of grooves and support structures.

DESCRIPTION OF A PREFERRED EMBODIMENT

The preferred embodiment of the invention will now be described with reference to the accompanying drawings herein:

Referring to FIG. 1, which shows the overall lamp and projection device 1 when fully assembled showing the lid 7 open at an angle to project an image onto a nearby wall surface as it might appear when in use.

Referring now to FIG 2, which shows the overall lamp and projection device 1 with one cube side 9 removed for clarity. The device comprises six identical side face panels 9 arranged at different rotations to form a cube. These interlock by means of protrusions 26 and recesses 20 on opposed faces. The left side casing 9 supports a lens assembly comprised of a lens 2 in a lens holder 3 bound between vertical struts 24 and is connected to a lens button 4 via a punched slot in the central groove 23 such that the overall lens assembly can be moved vertically. The device shows the metal bulb plate 11 supporting a bulb 10 and fixing into the cube sides 9 at groove slots 25. The slide 17 is shown in the centre of the cube 1 forming the main central axis and affixed into the slot 23 in the lower cube face panel 9. Reflecting mirrors 8 are shown on either side of the slide 17 at a forty-five degree angle to the slide and fixed by means of the edges of the central groove 23 in the respective cube panels 9 and form symmetrical diagonals on either side of the cube 1. Figure 2 illustrates the overall simple lens geometry from bulb 10 projecting downwards and reflecting off the mirrors 8 through the slide 17 and up through the condensing lens 2 to a distance surface or off the mirrored lid 5 and 7 when angled. The figure also shows an internal transformer 14 positioned in the recess beneath the angled mirror 8.

Referring now to FIG 3 which shows an exploded view of all components forming the lamp and projection device. This figure shows how the six cube sides 9 are rotated to form an overall cube assembly and contain support structures in different places. The lid 7 is an identical part to 9 and affixes a mirror 5 across the inside surface and shows an external button clip 18 for ease of access when closed. Hinges 6 connect to the cube panel moulded recess 21 are also shown to connect the lid 7 to the rest of the cube assembly 1. Electrical components including a lid micro-switch 13, connector 16, wire clips 15 and low-voltage transformer 14 are also shown and arranged in a usual manner to connect to the bulb 10 and switches.

Referring now to FIG 4 which shows a view of the metal bulb plate 11 in more detail. This would be formed from a single piece of die-cut and punched metal which is bent into the form illustrated and shows suitable venting at the top and open side sections to accommodate the slide 17, the bulb 10 and bulb locking wires 12, as well as an open front section to allow access for changing the bulb 10.

Referring now to Figure 5 which shows a view of a single cube side panel 9, showing the various support structures of struts, and slots/grooves, such as the central groove 23, side supports 24, metal bulb plate supports 25, hinge recesses 21, edge protrusions 26 and recesses 20 for assembling the cube. These provide horizontal and vertical rigidity to the overall cube side panel 9 as well as supporting the parts of the illumination system. Punchable holes 22 for affixing to a wall are also shown.

Although the invention is described and illustrated with reference to one preferred embodiment and arrangement of support structures within the cube assembly it is expressly understood that it is in no way limited to the disclosure of such a preferred embodiment, but is capable of numerous modifications within the scope of the claims. By way of example the optical arrangement could be adjusted to house an additional lens beneath the bulb 10 or a fresnel lens could be used in place or alongside a reflecting mirror. Similarly the bulb 10 as illustrated is assumed to be a parabolic bulb with controlled illumination but could be adapted to function with a different light emitting source.

CLAIMS

What is claimed is:

1. A lamp and projection device comprising:
 - a lamp body consisting of six substantially identical and modular interlocking faces assembled to form a cube;
 - a hinged top face lid with interior mirrored surface capable of reflecting and projecting a slide image at various angles from vertical to horizontal;
 - support structure for holding a removable slide and parts of the illumination system;
 - a projection system consisting of at least one lamp or light-emitting unit, a plurality of reflecting mirrors, at least one moveable condensing lens, and an electrical transformer and switch.
2. The lamp and projection device according to claim 1 where said faces are identical and contain recesses and protrusions at opposed edges such that they can be assembled by rotating appropriately and interlocked with similar parts in a cube arrangement.
3. The lamp and projection device according to Claim 1 or claim 2 where said faces contain an internal support structure of struts and grooves for fixing the parts of the illumination system where such grooves support various parts or are not used depending on their rotation and position as a cube face.
4. The lamp and projection device according to Claims 1 to 3 where said faces are formed from a semi-translucent material so as to provide soft illumination through the cube faces, and easily formed by injection moulding means.
5. The lamp and projection device according to Claims 1 to 4 where a micro-switch is used to turn the device on or off as the top hinged lid is opened
6. The lamp and projection device according to Claims 1 to 5 whereby a folded and punched metal sheet is used to support the bulb unit and provide suitable heat dispersion and venting.
7. The lamp and projection device according to Claims 1 to 6 where said cube faces contain recessed grooves suitable for being punched through during manufacture or during installation to create holes or grooves suitable for alternative wire exit or for affixing the lamp to a surface or wall
8. The lamp and projection device according to Claims 1 to 7 where a lens is supported in a lens holder tightly between vertical struts in the side-casing and connected through a

punched groove in a side face to a control button to enable controlled vertical movement of the lens for focusing.

9. The lamp and projection device according to Claims 1 to 8 whereby recessed regions passing almost all the way through the cube side faces are used to provide stronger areas of illumination or shadows for projecting ornamental lettering or symbols from the cube sides.
10. A lamp and projection device comprising a lamp body consisting of six identical modular and interlocking faces assembled by means of protrusions and recesses on opposed edges to form an overall cube with hinged top face lid that contains a mirrored inside surface and is capable of reflecting an image at various angles and acts to turn the device on by means of a micro-switch when opened, where said faces contain moulded support structures and grooves for providing rigidity to the overall device and for supporting parts of an illumination and slide projection system that consists of a folded sheet bulb holder, bulb, reflective mirrors, slide, condenser lens and movable lens holder, electrical transformer and switch components.
11. The ornamental design for a lamp and projection device according to Claims 1 to 10 and described and illustrated herein;

ABSTRACT

Abstract Title:

CUBE SHAPED LAMP AND PROJECTION DEVICE FOR SINGLE SLIDE

A lamp and projection device for a single slide comprising six substantially identical faces assembled to form a cube body which contains an illumination system consisting of a light-emitting unit, a electrical transformer unit and switches, a plurality of reflecting mirrors and at least one condensing lens arranged around the mid vertical axis of the cube where a slide can be positioned. Said faces containing interior structure to support and hold the components of the illumination system. Said overall cube body having a hinged face at the top which houses a reflecting mirror on the inside surface which can be positioned at any angle between a closed position and open perpendicular position to allow the slide to be projected onto a ceiling or at any angle onto an adjacent wall or nearby projection surface, with a micro-switch inside the cube body to switch off the device when the top face is closed. Said lens being adjustable by means of an external button to enable focusing. The overall faces being formed from a semi-translucent material to enable soft illumination in addition to the exterior slide projection with the overall device suitable for placing on a flat surface or fixed directly onto a wall and used as a wall lamp.

(Suggest use figure 2 as main drawing to accompany Abstract on first page)

Figure 1.

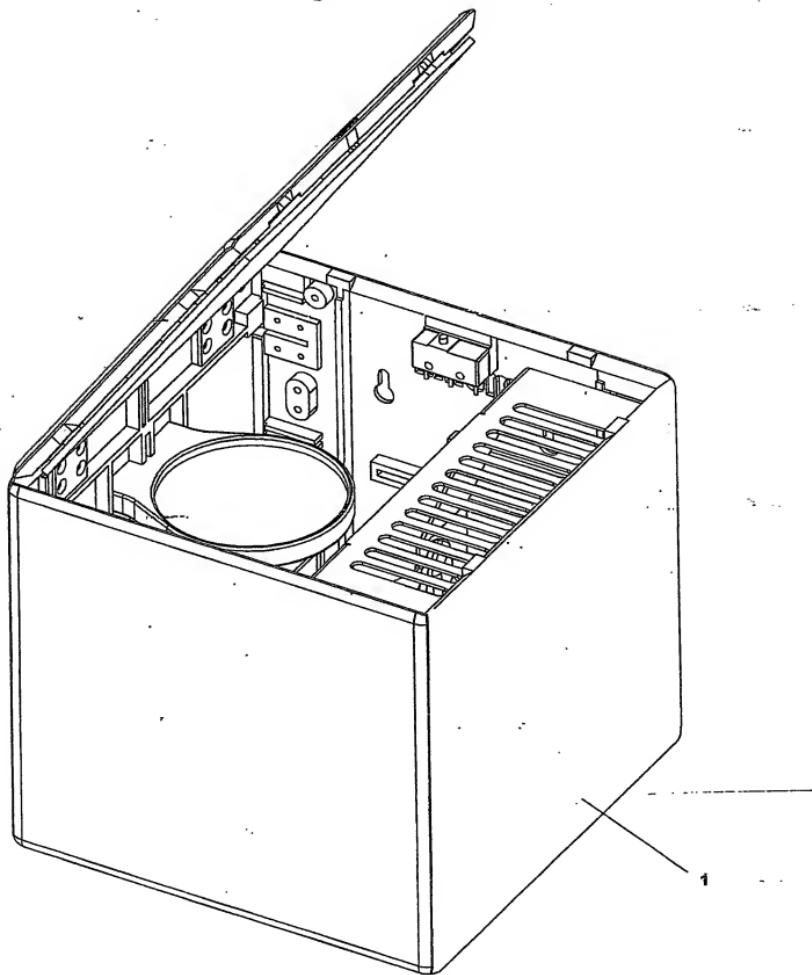
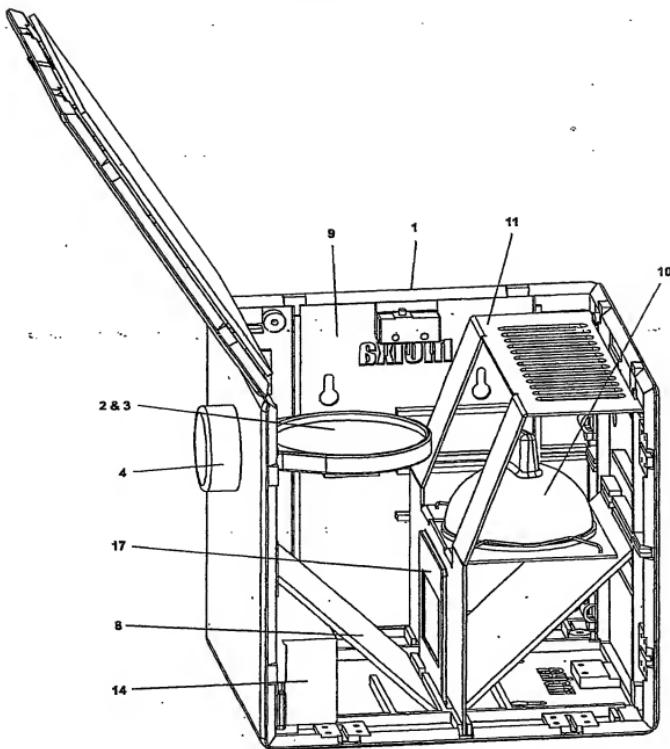
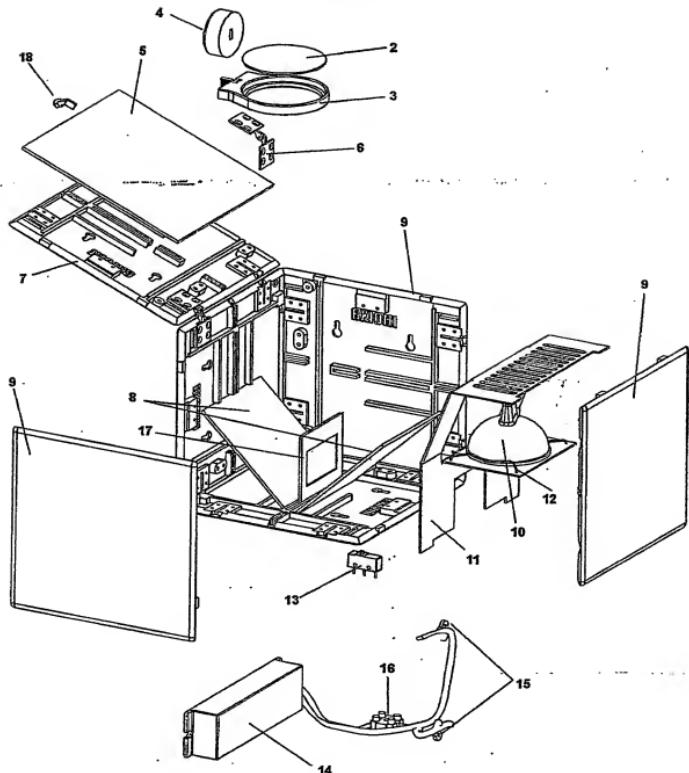


Figure 2.



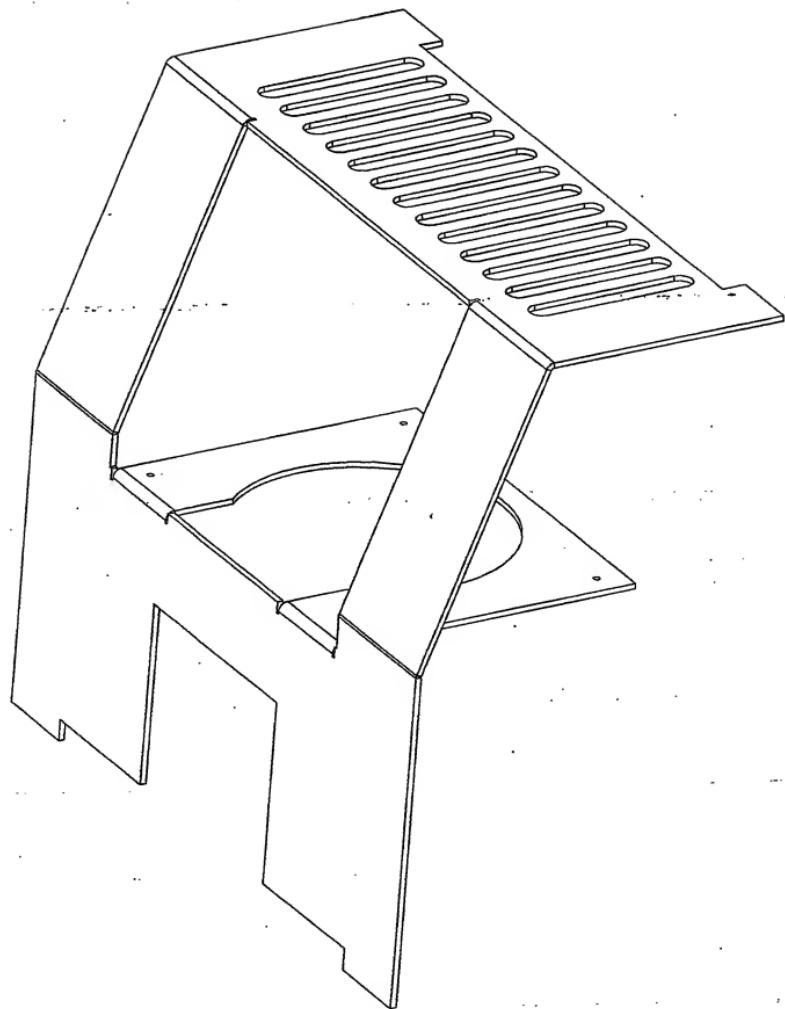
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Figure 3.



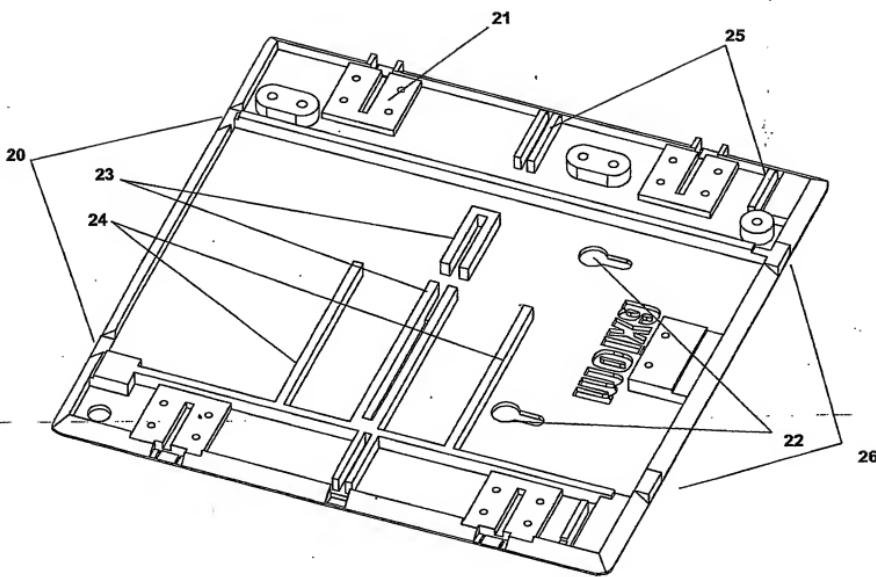
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Figure 4.



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Figure 5.



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